Exhibit 9

Exhibit 9
Claim 13 of U.S. Patent No. 10,075,941

"13. A mobile station served by a serving base station in an Orthogonal Frequency Division Multiplexing (OFDM) communication system,"

13. A mobile station served by a serving base station in an Orthogonal Frequency Division Multiplexing (OFDM) communication system,	Toyota's Accused Products include vehicles equipped with components and/or devices that enable connectivity to 4G/LTE networks and services, including services sold and provided by Toyota. To the extent the preamble is considered a limitation, Toyota's Accused Products meet the preamble of the '941 patent. *E.g.,* The LTE specification (Series 36, Release 8) specifies user equipments (UEs) receiving downlink control information. For example, release 8 of the 36 series 3GPP specifications was frozen in December of 2008 and that release was used as the basis for the first wave of LTE equipment. The LTE marketplace currently supports a mix of releases from Release 8 through Release 15. For ease of review release 8 of the LTE specification is cited below, but similar cites are available for each corresponding release on the market. LTE uses orthogonal frequency division multiplexing (OFDM) for downlink and uplink transmissions. **4.2 General description of Layer 1** **4.2.1 Multiple Access** The multiple access scheme for the LTE physical layer is based on Orthogonal Frequency Division Multiplexing (OFDM) with a cyclic prefix (CP) in the downlink, and on Single-Carrier Frequency Division Multiple Access (SC-FDMA) with a cyclic prefix in the uplink. To support transmission in paired and unpaired spectrum, two duplex modes are supported: Frequency Division Duplex (FDD), supporting full duplex and half duplex operation, and Time Division Duplex (TDD). The Layer 1 is defined in a bandwidth agnostic way based on resource blocks, allowing the LTE Layer 1 to adapt to various spectrum allocations. A resource block spans either 12 sub-carriers with a sub-carrier bandwidth of 15kHz or 24 sub-carriers with a sub-carrier bandwidth of 7.5kHz each over a slot duration of 0.5ms. *See e.g.*, 3GPP TS 36.201 V8.3.0 at pgs. 7-8. LTE downlink transmission use OFDM.

"13. A mobile station served by a serving base station in an Orthogonal Frequency Division Multiplexing (OFDM) communication system,"

	5.1 Downlink Transmission Scheme **5.1.1 Basic transmission scheme based on OFDM** The downlink transmission scheme is based on conventional OFDM using a cyclic prefix. The OFDM sub-carrier spacing is Δf = 15 kHz. 12 consecutive sub-carriers during one slot correspond to one downlink *resource block*. In the frequency domain, the number of resource blocks, N_{RB}, can range from $N_{RB\text{-}min}$ = 6 to $N_{RB\text{-}max}$ = 110. In addition there is also a reduced sub-carrier spacing Δf_{low} = 7.5 kHz, only for MBMS-dedicated cell. In the case of 15 kHz sub-carrier spacing there are two cyclic-prefix lengths, corresponding to seven and six OFDM symbols per slot respectively. - Normal cyclic prefix: $T_{CP} = 160 \times T_s$ (OFDM symbol #0), $T_{CP} = 144 \times T_s$ (OFDM symbol #1 to #6) *See e.g.*, 3GPP TS 36.300 V8.12.0 at pg. 25 LTE uplink transmissions use discrete Fourier transform spread OFDM (DFTS-OFDM).

"13. A mobile station served by a serving base station in an Orthogonal Frequency Division Multiplexing (OFDM) communication system,"

5.2 Uplink Transmission Scheme

5.2.1 Basic transmission scheme

For both FDD and TDD, the uplink transmission scheme is based on single-carrier FDMA, more specifically DFTS-OFDM.

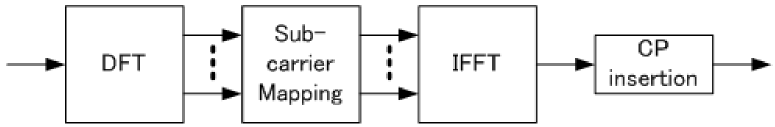

Figure 5.2.1-1: Transmitter scheme of SC-FDMA

The uplink sub-carrier spacing Δf = 15 kHz. The sub-carriers are grouped into sets of 12 consecutive sub-carriers, corresponding to the uplink resource blocks. 12 consecutive sub-carriers during one slot correspond to one uplink *resource block*. In the frequency domain, the number of resource blocks, N_{RB}, can range from $N_{RB\text{-}min} = 6$ to $N_{RB\text{-}max} = 110$.

There are two cyclic-prefix lengths defined: Normal cyclic prefix and extended cyclic prefix corresponding to seven and six SC-FDMA symbol per slot respectively.

- Normal cyclic prefix: $T_{CP} = 160 \times T_s$ (SC-FDMA symbol #0), $T_{CP} = 144 \times T_s$ (SC-FDMA symbol #1 to #6)

See e.g., 3GPP TS 36.300 V8.12.0 at pgs. 27-28.

"the communication system utilizing a transmission structure with time slots in the time domain and frequency subchannels in the frequency domain, the mobile station comprising a receiver configured to:"

the communication system utilizing a transmission structure with time slots in the time domain and frequency subchannels in the frequency domain, the mobile station comprising a receiver configured to:

Toyota's Accused Products are served by a base station in a communication system that utilizes a transmission structure with time slots in the time domain and frequency subchannels in the frequency domain, the mobile station comprising a receiver. *E.g.,*

LTE networks use a frame structure having time slots, such as Frame structure type 1 for FDD.

4.1 Frame structure type 1

Frame structure type 1 is applicable to both full duplex and half duplex FDD. Each radio frame is $T_f = 307200 \cdot T_s = 10\,\text{ms}$ long and consists of 20 slots of length $T_{slot} = 15360 \cdot T_s = 0.5\,\text{ms}$, numbered from 0 to 19. A subframe is defined as two consecutive slots where subframe i consists of slots $2i$ and $2i+1$.

For FDD, 10 subframes are available for downlink transmission and 10 subframes are available for uplink transmissions in each 10 ms interval. Uplink and downlink transmissions are separated in the frequency domain. In half-duplex FDD operation, the UE cannot transmit and receive at the same time while there are no such restrictions in full-duplex FDD.

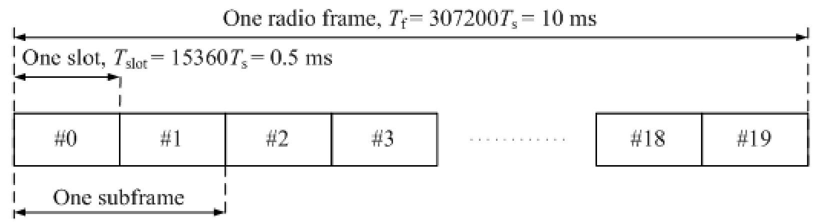

Figure 4.1-1: Frame structure type 1.

See e.g., 3GPP TS 36.211 V8.9.0 at pgs. 9-10.

An LTE base station, e.g., an eNodeB assigns a set of physical resource blocks (PRBs), forming a subchannel, to a UE for downlink transmission.

11.1.1 Downlink Scheduling

In the downlink, E-UTRAN can dynamically allocate resources (PRBs and MCS) to UEs at each TTI via the C-RNTI on PDCCH(s). A UE always monitors the PDCCH(s) in order to find possible allocation when its downlink reception is enabled (activity governed by DRX when configured).

See e.g., 3GPP TS 36.300 V8.12.0 at pg. 67.

"the communication system utilizing a transmission structure with time slots in the time domain and frequency subchannels in the frequency domain, the mobile station comprising a receiver configured to:"

	Each PRB has 12 or 24 subcarriers in the frequency domain. **6.2.3 Resource blocks** Resource blocks are used to describe the mapping of certain physical channels to resource elements. Physical and virtual resource blocks are defined. A physical resource block is defined as $N_{\text{symb}}^{\text{DL}}$ consecutive OFDM symbols in the time domain and $N_{\text{sc}}^{\text{RB}}$ consecutive subcarriers in the frequency domain, where $N_{\text{symb}}^{\text{DL}}$ and $N_{\text{sc}}^{\text{RB}}$ are given by Table 6.2.3-1. A physical resource block thus consists of $N_{\text{symb}}^{\text{DL}} \times N_{\text{sc}}^{\text{RB}}$ resource elements, corresponding to one slot in the time domain and 180 kHz in the frequency domain. Physical resource blocks are numbered from 0 to $N_{\text{RB}}^{\text{DL}} - 1$ in the frequency domain. The relation between the physical resource block number n_{PRB} in the frequency domain and resource elements (k,l) in a slot is given by $$n_{\text{PRB}} = \left\lfloor \frac{k}{N_{\text{sc}}^{\text{RB}}} \right\rfloor$$ **Table 6.2.3-1: Physical resource blocks parameters.** Configuration | $N_{\text{sc}}^{\text{RB}}$ | $N_{\text{symb}}^{\text{DL}}$ Normal cyclic prefix, $\Delta f = 15\,\text{kHz}$ | 12 | 7 Extended cyclic prefix, $\Delta f = 15\,\text{kHz}$ | 12 | 6 Extended cyclic prefix, $\Delta f = 7.5\,\text{kHz}$ | 24 | 3 A virtual resource block is of the same size as a physical resource block. Two types of virtual resource blocks are defined: - Virtual resource blocks of localized type - Virtual resource blocks of distributed type For each type of virtual resource blocks, a pair of virtual resource blocks over two slots in a subframe is assigned together by a single virtual resource block number, n_{VRB}. *See e.g.*, 3GPP TS 36.211 V8.9.0 at pgs. 46 and 47.

"receive a control message from the serving base station over a control channel, wherein:"

<table>
<tr>
<td>receive a control message from the serving base station over a control channel, wherein:</td>
<td>Toyota’s Accused Products receive a control message from the serving base station over a control channel. E.g.,

The resource assignment is sent to the UE over a physical downlink control channel (PDCCH).

5 Physical Layer for E-UTRA

Downlink and uplink transmissions are organized into radio frames with 10 ms duration. Two radio frame structures are supported:

...

The physical channels of E-UTRA are:

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Physical downlink control channel (PDCCH)

- Informs the UE about the resource allocation of PCH and DL-SCH, and Hybrid ARQ information related to DL-SCH;

- Carries the uplink scheduling grant.

See e.g., 3GPP TS 36.300 V8.12.0 at pgs. 23-24.

The PDCCH carries downlink control information (DCI), a control message.

4.2 Downlink

Table 4.2-1 specifies the mapping of the downlink transport channels to their corresponding physical channels. Table 4.2-2 specifies the mapping of the downlink control channel information to its corresponding physical channel.

...

Table 4.2-2

<table>
<tr><th>Control information</th><th>Physical Channel</th></tr>
<tr><td>CFI</td><td>PCFICH</td></tr>
<tr><td>HI</td><td>PHICH</td></tr>
<tr><td>DCI</td><td>PDCCH</td></tr>
</table>
See e.g., 3GPP TS 36.212 V8.8.0 at pg. 8.</td>
</tr>
</table>

"receive a control message from the serving base station over a control channel, wherein:"

	5.3.3 Downlink control information A DCI transports downlink or uplink scheduling information, or uplink power control commands for one RNTI. The RNTI is implicitly encoded in the CRC. *See e.g.*, 3GPP TS 36.212 V8.8.0 at pg. 43.

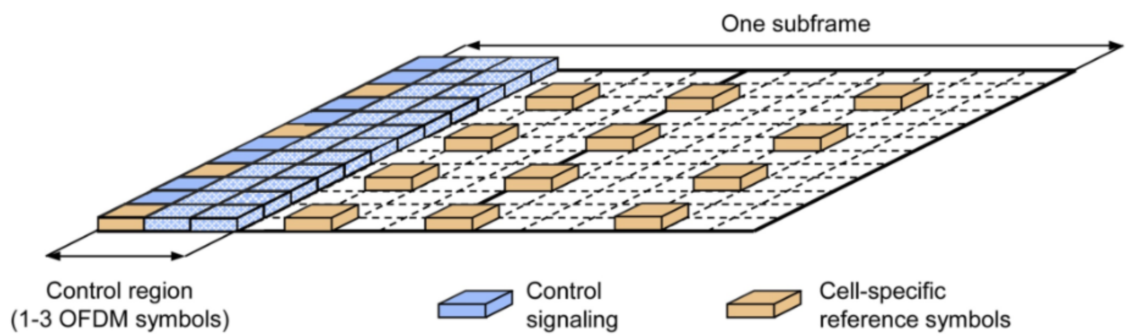
U.S. Patent No. 10,075,941: Claim 13(d)
"the control message contains transmission parameters specific to the mobile station for a subsequent transmission by the serving base station over a frequency subchannel to the mobile station in a time slot; and"

the control message contains transmission parameters specific to the mobile station for a subsequent transmission by the serving base station over a frequency subchannel to the mobile station in a time slot; and	The control message received by Toyota's Accused Products contains transmission parameters specific to the mobile station for a subsequent transmission by the serving base station over a frequency subchannel to the mobile station in a time slot. *E.g.*, The DCI includes scheduling information for a physical downlink shared channel (PDSCH) transmission. 5.3.3 Downlink control information A DCI transports downlink or uplink scheduling information, or uplink power control commands for one RNTI. The RNTI is implicitly encoded in the CRC. *See e.g.*, 3GPP TS 36.212 V8.8.0 at pg. 43. The PDSCH is transmitted in a subframe having two time slots. 7.1 UE procedure for receiving the physical downlink shared channel A UE shall upon detection of a PDCCH with DCI format 1, 1A, 1B, 1C, 1D, 2 or 2A intended for the UE in a subframe, decode the corresponding PDSCH in the same subframe with the restriction of the number of transport blocks defined in the higher layers. *See e.g.*, 3GPP TS 36.213 V8.8.0 at pg. 19. DCI format 2 has parameters such as a resource block assignment and precoding.

U.S. Patent No. 10,075,941: Claim 13(d)
"the control message contains transmission parameters specific to the mobile station for a subsequent transmission by the serving base station over a frequency subchannel to the mobile station in a time slot; and"

	5.3.3.1.5 Format 2 The following information is transmitted by means of the DCI format 2: - Resource allocation header (resource allocation type 0 / type 1) – 1 bit as defined in section 7.1.6 of [3] If downlink bandwidth is less than or equal to 10 PRBs, there is no resource allocation header and resource allocation type 0 is assumed. - Resource block assignment: - For resource allocation type 0 defined in section 7.1.6.1 of [3]: - $\lceil N_{RB}^{DL} / P \rceil$ bits provide the resource allocation - For resource allocation type 1 as defined in section 7.1.6.2 of [3]: - $\lceil \log_2(P) \rceil$ bits of this field are used as a header specific to this resource allocation type to indicate the selected resource blocks subset - 1 bit indicates a shift of the resource allocation span - $\left(\lceil N_{RB}^{DL} / P \rceil - \lceil \log_2(P) \rceil - 1\right)$ bits provide the resource allocation where the value of P depends on the number of DL resource blocks as indicated in subclause 7.1.6.1 of [3] - TPC command for PUCCH – 2 bits as defined in section 5.1.2.1 of [3] - Downlink Assignment Index (this field is present in TDD for all the uplink –downlink configurations and only applies to TDD operation with uplink–downlink configuration 1-6. This field is not present in FDD) – 2 bits - HARQ process number - 3 bits (FDD), 4 bits (TDD) - Transport block to codeword swap flag – 1 bit In addition, for transport block 1: - Modulation and coding scheme – 5 bits as defined in section 7.1.7 of [3] - New data indicator – 1 bit - Redundancy version – 2 bits

U.S. Patent No. 10,075,941: Claim 13(d)
"the control message contains transmission parameters specific to the mobile station for a subsequent transmission by the serving base station over a frequency subchannel to the mobile station in a time slot; and"

	In addition, for transport block 2: - Modulation and coding scheme – 5 bits as defined in section 7.1.7 of [3] - New data indicator – 1 bit - Redundancy version – 2 bits Precoding information – number of bits as specified in Table 5.3.3.1.5-3 *See e.g.*, 3GPP TS 36.212 V8.8.0 at pg. 47. The DCI is sent in the beginning of the subframe in the control region. **6.4. Downlink L1/L2 Control Signaling** To support the transmission of downlink and uplink transport channels, there is a need for certain associated downlink control signaling. This control signaling is often referred to as downlink L1/L2 control signaling, indicating that the corresponding information partly originates from the physical layer (Layer 1) and partly from Layer 2 MAC. Downlink L1/L2 control signaling consists of downlink scheduling assignments, including information required for the device to be able to properly receive, demodulate, and decode the DL-SCH[29] on a component carrier, uplink scheduling grants informing the device about the resources and transport format to use for uplink (UL-SCH) transmission, and hybrid-ARQ acknowledgments in response to UL-SCH transmissions. In addition, the downlink control signaling can also be used for the transmission of power-control commands for power control of uplink physical channels, as well as for certain special purposes such as MBSFN notifications. The basic time–frequency structure for transmission of L1/L2 control signaling is illustrated in Figure 6.20 with control signaling being located at the beginning of each subframe and spanning the full downlink carrier bandwidth. Each subframe can therefore be said to be divided into a control region followed by a data region, where the control region corresponds to the part of the subframe in which the L1/L2 control signaling is transmitted. Starting from release 11, there is also a possibility to locate parts of the L1/L2 control signaling in the data region as described later. However, the split of a subframe into a control region and a data region still applies.  Figure 6.20 LTE time–frequency grid illustrating the split of the subframe into (variable-sized) control and data regions. *See* 4G LTE-Advanced Pro and The Road to 5G, Third Edition, Dahlman et al..

U.S. Patent No. 10,075,941: Claim 13(d)
"the control message contains transmission parameters specific to the mobile station for a subsequent transmission by the serving base station over a frequency subchannel to the mobile station in a time slot; and"

	The PDSCH is sent after the control region OFDM symbols. **6.3.5 Mapping to resource elements** For each of the antenna ports used for transmission of the physical channel, the block of complex-valued symbols $y^{(p)}(0),...,y^{(p)}(M_{\mathrm{symb}}^{\mathrm{ap}}-1)$ shall be mapped in sequence starting with $y^{(p)}(0)$ to resource elements (k,l) which meet all of the following criteria: -they are in the physical resource blocks corresponding to the virtual resource blocks assigned for transmission, and -they are not used for transmission of PBCH, synchronization signals or reference signals, and -they are not in an OFDM symbol used for PDCCH as defined in section 6.7. The mapping to resource elements (k,l) on antenna port p not reserved for other purposes shall be in increasing order of first the index k over the assigned physical resource blocks and then the index l, starting with the first slot in a subframe. *See e.g.*, 3GPP TS 36.211 V8.9.0 at pg. 55.

U.S. Patent No. 10,075,941: Claim 13(e)
" the mobile station-specific transmission parameters indicate an antenna transmission scheme and a corresponding subchannel configuration, the antenna transmission scheme comprising a transmission diversity scheme or a multiple-input multiple-output (MIMO) scheme and the corresponding subchannel configuration characterized by distributed subcarriers or localized subcarriers in the frequency domain; and"

<table>
<tr>
<td>the mobile station-specific transmission parameters indicate an antenna transmission scheme and a corresponding subchannel configuration, the antenna transmission scheme comprising a transmission diversity scheme or a multiple-input multiple-output (MIMO) scheme and the corresponding subchannel configuration characterized by distributed subcarriers or localized subcarriers in the frequency domain; and</td>
<td>The mobile station-specific transmission parameters indicate an antenna transmission scheme and a corresponding subchannel configuration, the antenna transmission scheme comprising a transmission diversity scheme or a multiple-input multiple-output (MIMO) scheme and the corresponding subchannel configuration characterized by distributed subcarriers or localized subcarriers in the frequency domain. E.g.,

LTE uses multiple-input multiple-output for downlink transmissions.

5.1.5 Downlink multi-antenna transmission

Multi-antenna transmission with 2 and 4 transmit antennas is supported. The maximum number of codeword is two irrespective to the number of antennas with fixed mapping between code words to layers.

Spatial division multiplexing (SDM) of multiple modulation symbol streams to a single UE using the same time-frequency (-code) resource, also referred to as Single-User MIMO (SU-MIMO) is supported. When a MIMO channel is solely assigned to a single UE, it is known as SU-MIMO. Spatial division multiplexing of modulation symbol streams to different UEs using the same time-frequency resource, also referred to as MU-MIMO, is also supported. There is semi-static switching between SU-MIMO and MU-MIMO per UE.

In addition, the following techniques are supported:

- Code-book-based pre-coding with a single pre-coding feedback per full system bandwidth when the system bandwidth (or subset of resource blocks) is smaller or equal to12RB and per 5 adjacent resource blocks or the full system bandwidth (or subset of resource blocks) when the system bandwidth is larger than 12RB.

- Rank adaptation with single rank feedback referring to full system bandwidth. Node B can override rank report.

See e.g., 3GPP TS 36.300 V8.8.0 at pg. 26.

DCI format 2 includes a resource block assignment, subchannel configuration, and precoding information, antenna transmission scheme. For the precoding information, an index value of 0 indicates transmission diversity, and an index, such as 2, indicates a MIMO scheme.</td>
</tr>
</table>

U.S. Patent No. 10,075,941: Claim 13(e)
" the mobile station-specific transmission parameters indicate an antenna transmission scheme and a corresponding subchannel configuration, the antenna transmission scheme comprising a transmission diversity scheme or a multiple-input multiple-output (MIMO) scheme and the corresponding subchannel configuration characterized by distributed subcarriers or localized subcarriers in the frequency domain; and"

	5.3.3.1.5 Format 2 The following information is transmitted by means of the DCI format 2: - Resource allocation header (resource allocation type 0 / type 1) – 1 bit as defined in section 7.1.6 of [3] If downlink bandwidth is less than or equal to 10 PRBs, there is no resource allocation header and resource allocation type 0 is assumed. - Resource block assignment: - For resource allocation type 0 defined in section 7.1.6.1 of [3]: - $\lceil N_{RB}^{DL} / P \rceil$ bits provide the resource allocation - For resource allocation type 1 as defined in section 7.1.6.2 of [3]: - $\lceil \log_2(P) \rceil$ bits of this field are used as a header specific to this resource allocation type to indicate the selected resource blocks subset - 1 bit indicates a shift of the resource allocation span - $\left(\lceil N_{RB}^{DL} / P \rceil - \lceil \log_2(P) \rceil - 1\right)$ bits provide the resource allocation where the value of P depends on the number of DL resource blocks as indicated in subclause 7.1.6.1 of [3] - TPC command for PUCCH – 2 bits as defined in section 5.1.2.1 of [3] - Downlink Assignment Index (this field is present in TDD for all the uplink –downlink configurations and only applies to TDD operation with uplink –downlink configuration 1-6. This field is not present in FDD) – 2 bits - HARQ process number - 3 bits (FDD), 4 bits (TDD) - Transport block to codeword swap flag – 1 bit

U.S. Patent No. 10,075,941: Claim 13(e)
" the mobile station-specific transmission parameters indicate an antenna transmission scheme and a corresponding subchannel configuration, the antenna transmission scheme comprising a transmission diversity scheme or a multiple-input multiple-output (MIMO) scheme and the corresponding subchannel configuration characterized by distributed subcarriers or localized subcarriers in the frequency domain; and"

In addition, for transport block 1:

- Modulation and coding scheme – 5 bits as defined in section 7.1.7 of [3]

- New data indicator – 1 bit

- Redundancy version – 2 bits

In addition, for transport block 2:

- Modulation and coding scheme – 5 bits as defined in section 7.1.7 of [3]

- New data indicator – 1 bit

- Redundancy version – 2 bits

Precoding information – number of bits as specified in Table 5.3.3.1.5-3

...

The interpretation of the precoding information field depends on the number of enabled codewords according to Table 5.3.3.1.5-4 and Table 5.3.3.1.5-5. Note that TPMI indicates which codebook index is used in Table 6.3.4.2.3-1 or Table 6.3.4.2.3-2 of [2]. For a single enabled codeword, indices 18 to 34 inclusive in Table 5.3.3.1.5-5 are only supported for retransmission of the corresponding transport block if that transport block has previously been transmitted using two layers with closed-loop spatial multiplexing.

...

Table 5.3.3.1.5-3: Number of bits for precoding information

Number of antenna ports at eNodeB	Number of bits for precoding information
2	3
4	6

U.S. Patent No. 10,075,941: Claim 13(e)

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	Table 5.3.3.1.5-4: Content of precoding information field for 2 antenna ports (see table below) *See e.g.*, 3GPP TS 36.212 V8.8.0 at pgs. 49-52. The number of enabled codewords is determined from the modulation and coding scheme and redundancy version fields for the corresponding transport block. – In DCI formats 2 and 2A a transport block is disabled if $I_{MCS} = 0$ and if $rv_{idx} = 1$ otherwise the transport block is enabled. *See e.g.*, 3GPP TS 36.213 V8.8.0 at pg. 26.

One codeword: Codeword 0 enabled, Codeword 1 disabled		**Two codewords: Codeword 0 enabled, Codeword 1 enabled**	
Bit field mapped to index	**Message**	**Bit field mapped to index**	**Message**
0	2 layers: Transmit diversity	0	2 layers: Precoding corresponding to precoder matrix $\frac{1}{2}\begin{bmatrix}1 & 1\\ 1 & -1\end{bmatrix}$
1	1 layer: Precoding corresponding to precoding vector $\begin{bmatrix}1 & 1\end{bmatrix}^T/\sqrt{2}$	1	2 layers: Precoding corresponding to precoder matrix $\frac{1}{2}\begin{bmatrix}1 & 1\\ j & -j\end{bmatrix}$
2	1 layer: Precoding corresponding to precoder vector $\begin{bmatrix}1 & -1\end{bmatrix}^T/\sqrt{2}$	2	2 layers: Precoding according to the latest PMI report on PUSCH, using the precoder(s) indicated by the reported PMI(s)
…	…	…	…

U.S. Patent No. 10,075,941: Claim 13(e)

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	Resource allocation type 0 indicates the resource block groups assigned to the UE using a bit map. The bit map indicates whether adjacent resource block groups are used, localized subcarriers, or whether non-adjacent resource block groups are used, distributed subcarriers.

7.1.6.1 Resource allocation type 0

In resource allocations of type 0, resource block assignment information includes a bitmap indicating the resource block groups (RBGs) that are allocated to the scheduled UE where a RBG is a set of consecutive physical resource blocks (PRBs). Resource block group size (P) is a function of the system bandwidth as shown in Table 7.1.6.1-1. The total number of RBGs (N_{RBG}) for downlink system bandwidth of N_{RB}^{DL} PRBs is given by $N_{RBG} = \lceil N_{RB}^{DL} / P \rceil$ where $\lfloor N_{RB}^{DL} / P \rfloor$ of the RBGs are of size P and if $N_{RB}^{DL} \bmod P > 0$ then one of the RBGs is of size $N_{RB}^{DL} - P \cdot \lfloor N_{RB}^{DL} / P \rfloor$.

The bitmap is of size N_{RBG} bits with one bitmap bit per RBG such that each RBG is addressable. The RBGs shall be indexed in the order of increasing frequency and non-increasing RBG sizes starting at the lowest frequency. The order of RBG to bitmap bit mapping is in such way that RBG 0 to RBG $N_{RBG} - 1$ are mapped to MSB to LSB of the bitmap. The RBG is allocated to the UE if the corresponding bit value in the bitmap is 1, the RBG is not allocated to the UE otherwise.

Table 7.1.6.1-1: Type 0 Resource Allocation RBG Size vs. Downlink System Bandwidth

System Bandwidth N_{RB}^{DL}	RBG Size (P)
≤10	1
11 – 26	2
27 – 63	3
64 – 110	4

See e.g., 3GPP TS 36.213 V8.8.0 at pgs. 22 and 23.

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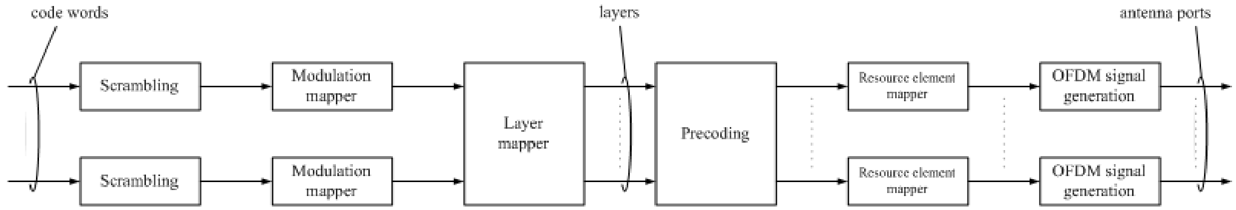
	7.1.6.2 Resource allocation type 1 In resource allocations of type 1, a resource block assignment information of size N_{RBG} indicates to a scheduled UE the PRBs from the set of PRBs from one of P RBG subsets. Also P is the RBG size associated with the system bandwidth as shown in Table 7.1.6.1-1. A RBG subset p, where $0 \le p < P$, consists of every P th RBG starting from RBG p. The resource block assignment information consists of three fields [4]. The first field with $\lceil \log_2(P) \rceil$ bits is used to indicate the selected RBG subset among P RBG subsets. The second field with one bit is used to indicate a shift of the resource allocation span within a subset. A bit value of 1 indicates shift is triggered. Shift is not triggered otherwise. The third field includes a bitmap, where each bit of the bitmap addresses a single PRB in the selected RBG subset in such a way that MSB to LSB of the bitmap are mapped to the PRBs in the increasing frequency order. The PRB is allocated to the UE if the corresponding bit value in the bit field is 1, the PRB is not allocated to the UE otherwise. The portion of the bitmap used to address PRBs in a selected RBG subset has size $N_{\mathrm{RB}}^{\mathrm{TYPE1}}$ and is defined as $N_{\mathrm{RB}}^{\mathrm{TYPE1}} = \lceil N_{\mathrm{RB}}^{\mathrm{DL}} / P \rceil - \lceil \log_2(P) \rceil - 1$ *See e.g.*, 3GPP TS 36.213 V8.8.0 at pg. 23.

receive a data packet transmitted by the serving base station using the mobile station-specific transmission parameters over the frequency subchannel.	Toyota's Accused Products receives a data packet transmitted by the serving base station using the mobile station-specific transmission parameters over the frequency subchannel. *E.g.*, The UE receives the downlink data over the assigned PDSCH. **7.1 UE procedure for receiving the physical downlink shared channel** A UE shall upon detection of a PDCCH with DCI format 1, 1A, 1B, 1C, 1D, 2 or 2A intended for the UE in a subframe, decode the corresponding PDSCH in the same subframe with the restriction of the number of transport blocks defined in the higher layers. *See e.g.*, 3GPP TS 36.213 V8.8.0 at pg. 19. The assigned PDSCH has one or two code words, a data packet. **6.3 General structure for downlink physical channels** This section describes a general structure, applicable to more than one physical channel. The baseband signal representing a downlink physical channel is defined in terms of the following steps: - scrambling of coded bits in each of the code words to be transmitted on a physical channel - modulation of scrambled bits to generate complex-valued modulation symbols - mapping of the complex-valued modulation symbols onto one or several transmission layers - precoding of the complex-valued modulation symbols on each layer for transmission on the antenna ports - mapping of complex-valued modulation symbols for each antenna port to resource elements - generation of complex-valued time-domain OFDM signal for each antenna port

	 **Figure 6.3-1: Overview of physical channel processing.** *See e.g.*, 3GPP TS 36.211V8.8.0 at pgs. 49-50.